

What is claimed is:

1. An organic electroluminescent device comprising cathode, anode and at least two mutually delimited emission layers which emit different light wavelengths, at least one phosphorescent emitter being present in at least one emission layer.
2. The organic electroluminescent device as claimed in claim 1, characterized in that further layers are present.
3. The organic electroluminescent device as claimed in claim 2, characterized in that the further layers are hole injection and/or hole transport layers.
4. The organic electroluminescent device as claimed in claim 2 and/or 3, characterized in that the further layers are electron injection and/or electron transport layers.
5. The organic electroluminescent device as claimed in one or more of claims 1 to 4, characterized in that it exhibits emission of light in the range from 380 nm to 750 nm.
6. The organic electroluminescent device as claimed in one or more of claims 1 to 5, characterized in that it has three mutually delimited emission layers.
7. The organic electroluminescent device as claimed in one or more of claims 1 to 6, characterized in that the three mutually delimited emission layers have the emission colors red, green and blue.
8. The organic electroluminescent device as claimed in one or more of claims 1 to 7, characterized in that the emission layers comprise both layers in which emitters are present as pure materials and layers in which a plurality of compounds are present in a dopant-matrix system; the weight ratio of matrix material to emitter being from 99:1 to 1:99.

9. The organic electroluminescent device as claimed in one or more of claims 1 to 8, characterized in that the phosphorescent emitter present is a compound which has at least one atom of atomic number greater than 38 and less than 84.
10. The organic electroluminescent device as claimed in claim 9, characterized in that the phosphorescent emitter comprises molybdenum, tungsten, rhenium, ruthenium, osmium, rhodium, iridium, palladium, platinum, silver, gold or europium.
11. The organic electroluminescent device as claimed in one or more of claims 1 to 10, characterized in that at least one of the emission layers comprises at least one nonphosphorescent emitter.
12. The organic electroluminescent device as claimed in claim 11, comprising at least one nonphosphorescent emitter from the classes of the styrylamines, coumarins, anthracenes, pyrenes, perylenes, oligoacenes, dicyanomethanes, compounds having spiro centers, heterocycles or metal complexes.
13. The organic electroluminescent device as claimed in one or more of claims 1 to 12, characterized in that at least one hole blocking layer (HBL) is present between at least two emission layers.
14. The organic electroluminescent device as claimed in claim 13, characterized in that the hole blocking materials (HBM) used are compounds from the classes of the azaphenanthrenes, metal chelate complexes, metal complexes or spirophenylenes.
15. The organic electroluminescent device as claimed in one or more of claims 1 to 14, characterized in that at least one electron blocking layer (EBL) is present between at least two emission layers.

16. The organic electroluminescent device as claimed in claim 15, characterized in that, the electron blocking materials (EBM) used are compounds from the classes of the triarylaminines, spirotriarylaminines or the phthalocyanines.
- 5 17. The organic electroluminescent device as claimed in one or more of claims 1 to 16, characterized in that at least one electron blocking layer (EBL) and at least one hole blocking layer (HBL) are present between at least two emission layers.
- 10 18. The organic electroluminescent device as claimed in one or more of claims 1 to 17, characterized in that the layer thickness of the mutually delimited emitter layers have a thickness of from 1 to 150 nm.
- 15 19. The organic electroluminescent device as claimed in one or more of claims 1 to 18, characterized in that the layer thickness of the electron transport and hole blocking layers have a thickness of from 1 to 150 nm.
- 20 20. The organic electroluminescent device as claimed in one or more of claims 1 to 19, characterized in that the layer thickness of the electron transport and hole blocking and emitter layers each have a different thickness in the range from 1 to 150 nm.
- 25 21. The organic electroluminescent device as claimed in one or more of claims 1 to 20, characterized in that the glass transition temperature T_g of the emitter is greater than 90°C.
- 30 22. The organic electroluminescent device as claimed in one or more of claims 1 to 21, characterized in that the glass transition temperature T_g of the matrix materials of the emission layers is greater than 100°C.
23. The organic electroluminescent device as claimed in one or more of claims 1 to 22, characterized in that the glass transition temperature T_g of all materials used (in all layers) is greater than 90°C.

Abstract

Organic electroluminescent element

5 The present invention relates to organic electroluminescent devices which comprise at least two mutually delimited emission layers, these emitting different light wavelengths.

10 The inventive electroluminescent device has the feature that at least one of the emitter layers comprises at least one phosphorescent emitter.